TECHNICAL NOTES

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Regeneration of Balsam Fir Guaranteed by Continuous Reserve of Small Seedlings

Since balsam fir produces seed crops at frequent intervals and the resulting seedlings can live for at least a few years under heavy shade, balsam stands typically have a reserve supply of established reproduction at all times. The magnitude of this seedling reserve is illustrated by data recently obtained from a cutting study on the Pike Bay Experimental Forest. Mil-acre reproduction strips were examined both before and after logging in a pure balsam fir stand, 40 to 70 years old, which was cut by several methods in the winter of 1950-51. The number of seedlings varied according to treatment (see table).

Seedling height	Seedlings per acre according to treatment				
	Clear cut	Heavy selection	Moderate selection	Light selection	No cutting
Inches	Number in thousands				
BEFORE CUTTING					
1 to 5	99	82	75	60	107
6 and larger	6	4	2	2	6
Total	105	86	77	62	113
AFTER CUTTING					
1 to 5	33	45	47	37	80
6 and larger	3	2	2	2	3
Total	36	47	49	39	83
Percent survival	34	55	64	63	73

Mortality has been very high on all cuttings, ranging from 37 to 66 percent. Although most of this has been due to logging, a sizable amount, judging from the 27-percent loss on the uncut area, would likely have occurred even had there been no cutting. In spite of the heavy losses, however, there still remain thousands of balsam fir seedlings. Most of these are less than 6 inches high, the larger individuals averaging 3.5 inches in height and 5 years of age.

The fact that there are much fewer trees 6 inches and up indicates that most balsam fir seedlings are able to survive for only a few years. Although these larger seedlings occur on only about 50 percent of the quadrats, there is no cause for concern since the improved light conditions should enable much of the smaller reproduction to develop into trees. Rather than there being a scarcity of reproduction, it seems more likely that on at least the heavier cuttings the reproduction will be too dense.

In view of the great number of seedlings under this balsam fir stand at the time of logging, it is hardly surprising that commercial cuttings in this type are often followed by sapling thickets which are so dense as to require thinning.

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EUGENE I. ROE, Research Forester.